

The State of Building a Consistent Framework for Curation and Presentation of Earth Science Data Quality

Ge Peng¹, Hampapuram Ramapriyan², and David F. Moroni³

¹ Cooperative Institute for Climate and Satellites–North Carolina (CICS-NC) and NOAA National Centers for Environmental Information (NCEI), Asheville, NC

² Science Systems and Applications, Inc. (SSAI) and NASA Goddard Space Flight Center (GSFC), Greenbelt, MD; ³ Jet Propulsion Laboratory (JPL), California Institute of Technology, Pasadena, CA

Background

Improving collection, description, discovery, and usability of information about data quality in Earth science data products is critical in ensuring data use but requires coordinated efforts of people from multiple disciplines.

Under the auspices of the Federation of Earth Science Information Partners (ESIP), the Information Quality Cluster (IQC) brings together national and international data quality management researchers and practitioners from various disciplines to evaluate and establish best practices and standards for data quality for the Earth science community. The IQC evaluates community data quality best practices and standards; makes recommendations for improvement in various aspects of managing data quality in Earth science data products; ensures that producers of data products are aware of standards and best practices for conveying data quality, and data providers/distributors/intermediaries establish, improve, and evolve mechanisms to assist users in discovering and understanding data quality information; and provides guidance to data managers and stewards on how best to implement data quality standards and best practices to ensure and improve maturity of their data products.

This presentation will provide an overview of the current state of building a consistent framework for curating and presenting Earth science data quality in terms of science, product, stewardship, and service maturity of individual datasets.

Outline of Agency and International Community Activities

- **ESIP Activities**
 - Information Quality Cluster–focused on identifying challenges, use cases, representation of DQ (Data Quality)/IQ (Information Quality) to help users
- **Other relevant activities**
 - NASA Earth Science Data System Working Groups (ESDSWG)–Metrics Planning and Reporting WG (Product Quality Checklists)–2010–2012
 - NASA ESDSWG Data Quality WG (Recommendations)–2014–present
 - NOAA Data and Stewardship Maturity Matrices–2008–present
 - EUMETSAT CORE-CLIMAX System Maturity Matrix and GAIA-CLIM Measurement Maturity Matrix (e.g., http://presentations.copernicus.org/EGU2015-10158_presentation.pdf–2014)
 - CEOS Essential Climate Variables (ECV) Inventory Questions
 - GEOSS Data Quality Guidelines
 - Quality Assurance framework for Earth Observation (QA4EO)
 - ISO Metadata Quality Standards (19157:2013; 19158:2012)
 - NCAR Community Contribution Portal

Getting Involved with ESIP Information Quality Cluster

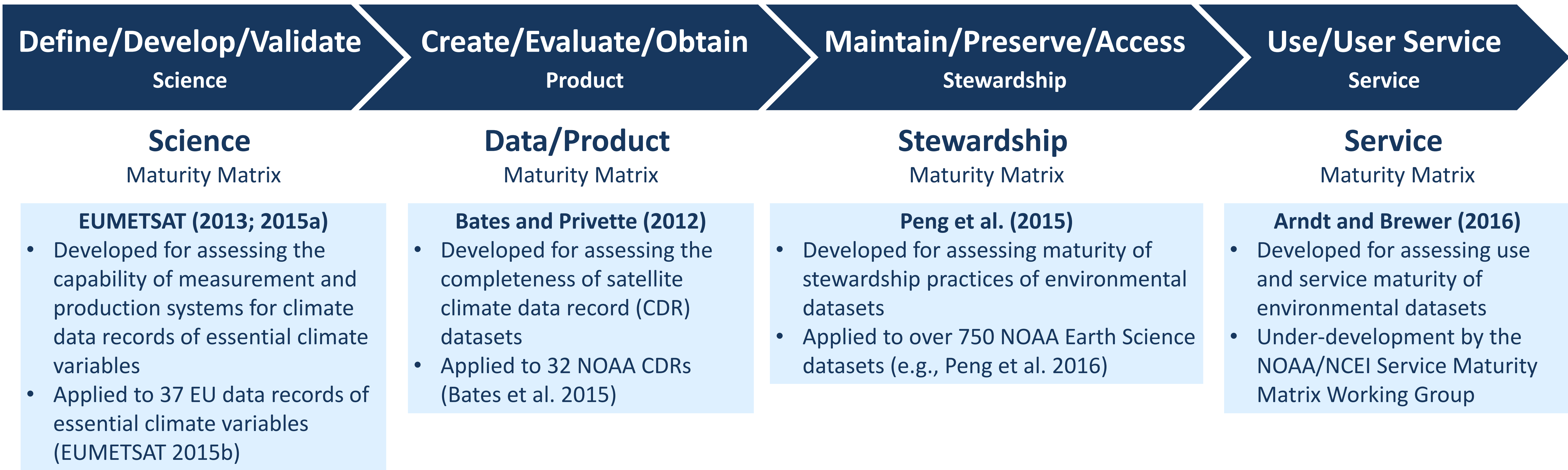
- Information Quality Cluster (IQC) of the Federation of Earth Science Information Partners (ESIP) coordinates and facilitates evaluation of best practices and standards for data quality from the Earth Science community.
- Its vision is to become internationally recognized as an authoritative and responsive information resource for guiding the implementation of data quality standards and best practices of the science data systems, datasets, and data/metadata dissemination services.
- Participation is encouraged and anyone can join by subscribing to the ESIP IQC email list at http://wiki.esipfed.org/index.php/Information_Quality

Types of Earth Science Data Quality

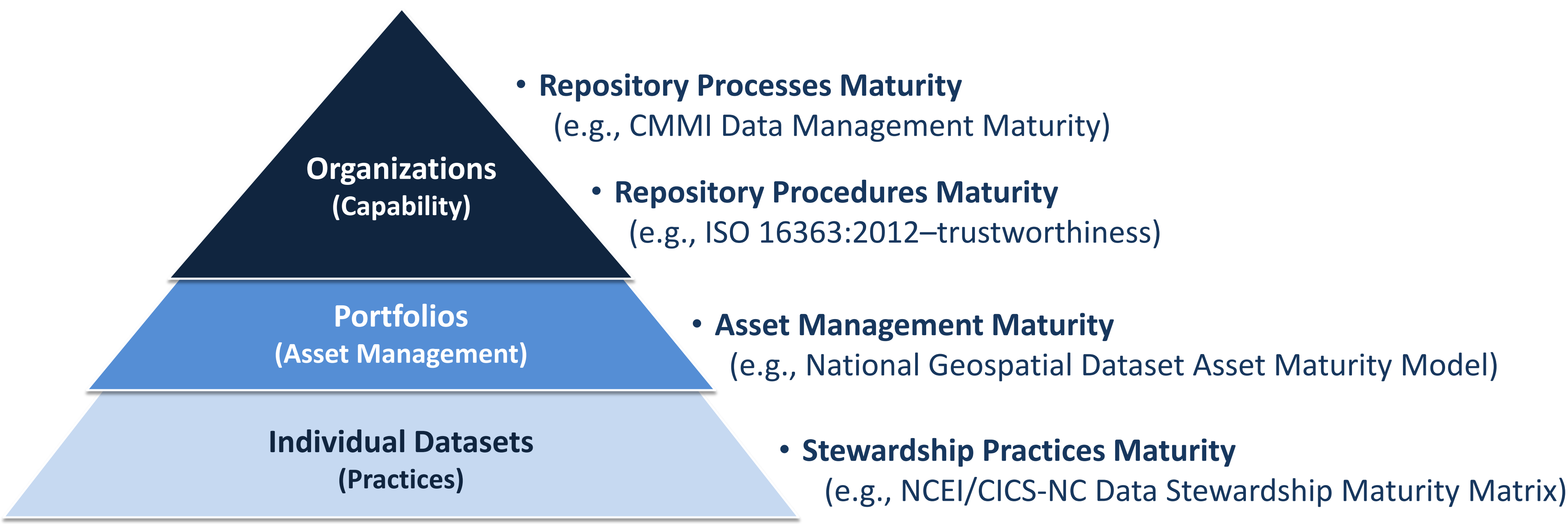
- **Scientific quality** is defined in terms of accuracy, precision, uncertainty, validity, and suitability for use (fitness for purpose);
- **Product quality** takes the following considerations into account: the degree to which the scientific quality is assessed and documented; how accurate, complete and up-to-date the metadata and documentation are;
- **Stewardship quality** addresses questions such as how well data are being managed, preserved, accessed, and cared for;
- **Service quality** deals with how easy it is for users to find, get, understand, trust, and use a given data product along with its metadata, as well as ensuring an archive has the requisite knowledge base and people functioning as subject matter experts available to help its data users.

(Based on Ramapriyan et al. 2016)

Dataset Lifecycle-Stages-Based Maturity Assessment Frameworks



Tiers of Maturity Assessment Models



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